

This listing of claims will replace all prior versions and listing of claims in the application:

**Listing of Claims:**

1 – 36 (Canceled)

37. (Original) A system for diagnosing the quality of a reagent solution, comprising:

a reagent solution source for supplying the reagent solution to an emissions catalyst of an internal combustion engine;

means for determining a quality value corresponding to the quality of the reagent solution;

a first filter receiving the quality value and producing a first filtered quality value;

a second filter receiving the quality value and producing a second filtered quality value; and

a comparator comparing a difference between the first and second filtered quality value to a first threshold and producing a fault value if the difference crosses the first threshold.

38. (Original) The system of claim 37 wherein the comparator is configured to further compare the difference to a second threshold and produce the fault value if the difference crosses the second threshold.

39. (Original) The system of claim 38 wherein the first and second thresholds define a range of acceptable filtered quality values therebetween;

and wherein the comparator is configured to produce the fault value if the difference is outside the range of acceptable filtered quality value values.

40. (Original) The system of claim 37 further including:

a memory; and

a fault timer activating in response to the fault value and logging the fault value in the memory after expiration of the fault timer.

41. (Original) The system of claim 37 further including:

a fault lamp; and

a control circuit responsive to the fault value to illuminate the fault lamp.

42. (Original) The system of claim 37 further including:

a wireless transceiver; and

a control circuit responsive to the fault value to transmit the fault value to a remote receiver via the wireless transceiver.

43. (Original) The system of claim 37 further including:

a fuel system responsive to a fuel control signal to supply fuel to the engine; and

a control circuit responsive to the fault value to modify engine performance by modifying the fuel control signal.

44. (Original) The system of claim 37 further including a first control computer implementing the first and second filters and the comparator in the form of one or more software algorithms.

45. (Original) The system of claim 44 further including a second control computer configured to manage overall operation of the engine;

and wherein the first control computer is configured to transfer the fault value to the second control computer via a communication link for conducting communications between the first and second control computers.

46. (Original) The system of claim 44 wherein the first control computer is further configured to manage overall operation of the engine.

47. The system of claim 37 wherein the first filter is a long range averaging filter and the second filter is a short range averaging filter.

48. (Original) The system of claim 37 further including means for determining whether the reagent solution source has been refilled with the reagent solution;

wherein the system is operable to produce the fault signal only if the reagent solution source has been refilled with the reagent solution.

49. (Original) The system of claim 37 further including:

a temperature sensor producing a temperature signal indicative of a temperature of the reagent solution; and

a threshold determining circuit determining the first threshold as a function of the temperature signal.

50. (Original) The system of claim 49 wherein the comparator is configured to further compare the difference to a second threshold and produce the fault value if the difference crosses the second threshold;

and wherein the threshold determining circuit is configured to determine the second threshold as a function of the temperature signal.

51. (Original) The system of claim 50 wherein the first and second thresholds define a range of acceptable difference values therebetween;

and wherein the comparator is configured to produce the fault value if the difference is outside the range of acceptable difference values.

52. (Original) The system of claim 51 further including:

a memory; and

a fault timer activating in response to the fault value and logging the fault value in the memory after expiration of the fault timer.

53. (Original) The system of claim 37 further including:

a number of the first filters each configured to receive the quality value and produce a different first filtered quality value;

a number of the second filters each configured to receive the quality value and produce a different second filtered quality value;

a number of the comparators each configured to compare a difference between corresponding ones of the number of first and second filtered quality values to a different one of a corresponding number of first thresholds, and to produce the fault value if the corresponding difference crosses the corresponding one of the number of first thresholds;

a temperature sensor producing a temperature signal indicative of a temperature of the reagent solution; and

a switching circuit supplying the quality value only to an appropriate one of the first and second filters as a function of the temperature signal.

54. (Original) The system of claim 53 wherein each of the number of comparators is configured to further compare a corresponding one of the differences to a different one of a corresponding number of second thresholds, and to produce the fault value if the corresponding difference crosses the corresponding one of the number of second thresholds.

55. (Original) The system of claim 54 wherein the first and second thresholds for each of the number of comparators define a different one of a number of corresponding ranges of acceptable difference values therebetween;

and wherein each of the number of comparators is configured to produce the fault value only if the corresponding difference is outside a corresponding one of the number of ranges of acceptable difference values.

56. (Original) The system of claim 55 further including:

a memory; and

a fault timer activating in response to the fault value and logging the fault value in the memory after expiration of the fault timer.

57 – 72 (Canceled)